AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remains under examination in the application are presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough; and 2. added matter is shown by underlining.

1. (Currently Amended) An in vitro method for producing neurons ~~from astrocytes~~, the method comprising a culturing step of establishing a group of cells by culturing ~~the~~ astrocytes in vitro, and a subsequent treatment step of exposing the group of cells to at least one added factor that is a FGF family member such that neurons are produced as a result of the added factor.

2. (Canceled )

3. (Canceled)

4. (Previously Presented) The method of claim 1 wherein the FGF family member is bFGF.

5. (Original) The method of claim 4 wherein the treatment step lasts at least one day.

6. (Previously Presented) The method of claim 4 further comprising a subsequent in vitro differentiation step performed after exposing the group of cells to the at least one added factor,

the in vitro differentiation step comprising culturing the group of cells without the added factor whereby the neurons are produced after the in vitro differentiation step.

7. (Original) The method of claim 6 wherein the in vitro differentiation step lasts at least one day.

8. (Original) The method of claim 6 wherein the treatment step lasts at least three days and the in vitro differentiation step lasts at least three days.

9. (Original) The method of claim 6 wherein the treatment step lasts three to nine days and the in vitro differentiation step lasts four to nine days.

10. (Original) The method of claim 1 wherein the added factor is an agent that interacts with cell receptors that are recognized by a member of the FGF family.

11. (Original) The method of claim 1 wherein the growth factor is an agent that interacts with cell receptors that are recognized by bFGF.

12. (Currently Amended) A method of producing a second cell type ~~from astrocytes~~, the method comprising an initial culturing step of culturing [[the]] astrocytes and a subsequent treatment step of contacting the astrocytes with an added factor, the added factor being at least

one growth factor chosen from the FGF family, and wherein the second cell type is a neuron or oligodendrocyte.

Claims 13-14 (Canceled)

15. (Withdrawn) ~~The method of claim 14 wherein the member of the neurotrophin family is NGF.~~

16. (Withdrawn) ~~The method of claim 14 wherein the member of the neurotrophin family is chosen from the group consisting of BDNF, NT-3, and NT-4/5.~~

Claims 17-22 (Canceled)

23. (Withdrawn) ~~The method of claim 22 wherein the added growth factor includes FGF-1.~~

24. (Previously Presented) The method of claim 12 wherein the at least one added growth factor is FGF-2.

25. (Withdrawn) ~~The method of claim 22 wherein the added growth factor includes FGF-3.~~

26. (Withdrawn) ~~The method of claim 22 wherein the added growth factor includes FGF-4.~~

27. (Withdrawn) ~~The method of claim 22 wherein the added factor includes at least one growth factor chosen from the group consisting of FGF-5, FGF-6, and FGF-7.~~

28. (Withdrawn) ~~The method of claim 22 wherein the added factor includes FGF-8.~~

29. (Withdrawn) ~~The method of claim 22 wherein the added factor includes at least one growth factor chosen from the group consisting of FGF-9 and FGF-10.~~

30. (Withdrawn) ~~The method of claim 22 wherein the added factor includes at least one growth factor chosen from the group consisting of FGF-11, FGF-12, FGF-13, FGF-14, FGF-15, and FGF-16.~~

31. (Withdrawn) ~~The method of claim 22 wherein the added factor includes at least one growth factor is chosen from the group consisting of FGF-17 and FGF-18.~~

32. (Original) The method of claim 12 wherein the added factor is an agent that interacts with cell receptors recognized by a member of the FGF family.

33. (Canceled)

34. (Withdrawn) ~~The method of claim 13 wherein the added factor is a neuropetic cytokine.~~

35. (Withdrawn) ~~The method of claim 34 wherein the neuropetic cytokine is CNTF.~~

Claims 36-37 (Canceled)

38. (Original) A method of treating astrocytes to produce a population of cells that includes neurons and/or oligodendrocytes, the method comprising a step of culturing the astrocytes and contacting the astrocytes in vitro with bFGF.

39. (Previously Presented) A method of manipulating an in vitro culture of glial cells to produce a second cell type, the method comprising:

a culturing step of culturing a group of glial cells;

a dissociation step of dissociating the group of cells; and

a subsequent treatment step of contacting the group of cells with an added factor, the added factor including at least one growth factor chosen from the FGF family.

40. (Original) The method of claim 39 wherein the glial cells in the culturing step are astrocytes.

41. (Original) The method of claim 40 wherein the dissociation step includes exposing the group of cells to trypsin.

42. (Original) The method of claim 39 wherein the second cell type is a multipotent cell type.

43. (Original) The method of claim 39 further comprising the step of pretreating the cultured cells with the added factor prior to the dissociation step.

Claims 44-45 (Canceled)

46. (Previously Presented) The method of claim 43 wherein the member of the FGF family is bFGF.

47. (Original) The method of claim 46 wherein the pretreatment step lasts one to seven days, the treatment step lasts three to fourteen days.

48. (Previously Presented) The method of claim 47 further comprising an in vitro differentiation step, the in vitro differentiation step being performed after contacting the group of cells with the added factor and comprising culturing the group of cells without the added factor.

49. (Previously Presented) A method of screening growth factors for transdifferentiation, the method comprising the steps of:

(a) growing cultured cells in vitro, including a first cell type but not a second cell type;

(b) dissociating the cultured cells;

(c) replating the cells into a plurality of test well means;

(d) adding a test factor to the test well means;

(e) growing the cells in the test well means in the presence of the test factor;

(f) subsequently growing the cells in the test well means in the absence of the test factor;

(g) examining the cells to determine if cells of the second type are present; and

(h) Running a control experiment in other test well means using a member of the fibroblast growth factor family, wherein the first cell type is a glial cell and the second cell type is a neuron or oligodendrocytes.

50. (Original) The method of claim 49 wherein the first cell type is astrocytes and the second cell type is neurons and the test growth factor is added to the wells in a concentration ranging from 0.05 to 1000 ng per ml.

51. (Original) The method of claim 49 wherein the first cell type is astrocytes and the second cell type is oligodendrocytes and the test growth factor is added to the wells in a concentration ranging from 0.05 to 1000 ng per ml.

52. (Original) The method of claim 50 wherein step (e) has a duration ranging from seven to twenty-eight days; and step (f) has a duration ranging from three to twenty-one days.

53. (Original) The method of claim 52 wherein step (h) is performed with bFGF.

54. (Original) The method of claim 50 wherein step (e) has a duration ranging from fourteen to twenty-one days; and step (f) has a duration ranging from seven to fourteen days.

55. (Original) The method of claim 54 wherein step (h) is performed with bFGF.

56. (Original) The method of claim 55 wherein the bFGF of step (h) is present in a concentration of at least 50 picomolar.

57. (Currently Amended) An in vitro method for producing neurons ~~from astrocytes~~, the method comprising a culturing means for culturing astrocytes in vitro, and a subsequent treatment step of exposing the group of cells to at least one growth factor means, the growth factor means causing the production of neurons from the astrocytes and being chosen from the FGF family.

58. (Original) The method of claim 57 wherein the growth factor means is a means of accomplishing the biological effects that are accomplished by bFGF.

59. (Original) The method of claim 58 wherein the treatment step lasts at least three days and the in vitro differentiation step lasts at least three days.

Claims 60-63 (Canceled)

64. (Currently Amended) A method of producing a multipotent cell type ~~from an astrocyte~~, the method comprising an initial culturing step of culturing [[the]] astrocytes and a subsequent treatment step of contacting the astrocytes with FGF.

REMARKS

Claims 1, 4-12, 15-16, 23, 32, 34-35, 38-43, 46-59 and 64 are pending. Claims 15, 16, 23, 25-31, 34-35 and 45 are withdrawn from examination. Claims 1, 4-12, 24, 32, 38-43, 46-59, and 64 stand rejected under 35 U.S.C. 112 ¶ 1 for lack of enablement. Other grounds of rejection have previously been withdrawn. Claims 1, 12, 57 and 64 are amended herein.

The undersigned has previously maintained that fully differentiated astrocytes were specified by the term "astrocytes". The Examiner has maintained that the claimed inventions were not enabled because other cell types besides fully differentiated astrocytes, e.g., astrocyte precursors as described in Laywell et al., must be included in the cultures, see Advisory Action dated June 06, 2003.

The undersigned has considered the Examiner's position and concedes that it might be possible that the presently claimed invention operates as the Examiner has suggested. Accordingly, the claims have been amended, where needed, so that the claimed process does not require the exclusive presence of only fully differentiated astrocytes in the cultures.

Indeed, the undersigned has unduly emphasized a particular theory of the operation of the invention in the prosecution of the claims, and regrets the distractions thereby created. The Applicant, however, is not bound by, nor required to subscribe to, any particular theory of operation of the claimed invention, so that the Applicant is not required to claim a particular theory of operation. In re Bowden, 183 F.2d 115, 119, 86 USPQ 419, 422 (CCPA 1950).

The presently amended claims, therefore, do not specify a particular theory of operation, and thus no longer claim that non-neuronal cells must necessarily be derived from fully differentiated astrocytes. Instead, the present claims are directed to cultures that contain, but are not necessarily limited to, astrocytes. One, but not the only, aspect of the presently claimed inventions is that cultures having astrocytic cells may be used as part of a process or

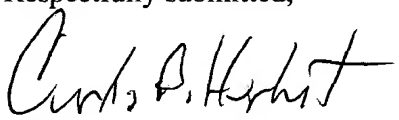
composition to produce the claimed cell types. Thus the claimed invention is in contrast to methods that would require purified stem cell cultures, elaborate processes to capture stem cells, or complicated co-cultures of certain types of stem cells with certain other cell types. Indeed, an advantage of the presently claimed invention is that persons that familiar with routine cell culture processes are readily able to practice the claimed invention after reading the patent application.

Thus, it is respectfully submitted that this rejection has been overcome.

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



Curtis B. Herbert, Esq.
Registration No. 45,443

Customer No. 24113
Patterson, Thuente, Skaar & Christensen, P.A.
4800 IDS Center
80 South 8th Street
Minneapolis, Minnesota 55402-2100
Telephone: (612) 349-3008